G. R. S. IX-5]

Previous references.

File No. 115-18

1918.

Serial Nos. ~~1-13~~ 1-14

(G. M)

Later references.
Part-44-M-(1-3)

preserve RB 5/9 p. 35

GENERAL AND REVENUE SECRETARIAT.

Serial Nos. 1-14

Part B for March 19.

SUBJECT.

Invention for "Process and apparatus for the cracking of Hydrocarbon oils" by John Nelson of Glasgow.

G. 22511-13 of 4-4-19.

forwards a copy of the Specification for record

W D 1250—GPB—30,000 · 28-1-19

G. R. S. 11] 1918-19

GENERAL AND REVENUE SECRETARIAT.

(G.M)

NOTES.

File No. 115-18

FILE HEADING.

Invention for "Process and Apparatus for the cracking of Hydrocarbon oils and the like" by John Nelson, merchant, of 86, St Vincent Street, Glasgow, Scotland

From

Messrs Remfrey & Son, Calcutta

No. nil Dated 28th Nov. 1918 Received 3-12-1918

Diary No. 8876	Enclos. 3	Spare Copies.	Serial No.

BRIEF ABSTRACT OF LETTER.

Forwards an application and a power of attorney for leave to file a specification from Use in respect of the above invention.

NOTES AND ORDERS.

7 The patent had been filed in British India Vide certified copy flag 7

Has money been received. 16-12-18

The usual drafts are submitted

NOTES—First Sheet.

GPB—20,000-8-8-14

General and Revenue Secretariat. | File No. 15 of 191 8-19

Serial No.	
	Subd.
	1) Money has been received. The necessary entries have been made in the Treasury Remittance Register and submitted for Kind signature 19.1.19
	3) Issue of Bpo 25/1
2	Do The Registrar, Mysore University Letter no G.13396 dt 6-1-19 Forwards the specification of the invention referred to in sl 1, for furnishing the opinion of next of kin Professor, Central College Bangalore, under Section 6 clause 2 of Mysore Inventions & Designs Regn
3	Do The Supt of Stamps Letter no G 13397 dt 6-1-19. Forwards the power of Attorney received vide sl: 1 for being impressed with the Mysore Judicial Stamps of the value of Rupee one
(41	From The Supt of Stamps Letter no P B 172 dt 11-1-19 Forwards duly stamped the power of Attorney referred to in sl: 3

in the file

NOTE—Contn. sheet.

WD A 1789—GPB—60,000—20-3-18—S.

G. R. S. III-2]

General and Revenue Secretariat.

File No. 115 of 1918-19

Serial No.	
5	From The Treasury Officer. Letter dt 16-1-19 Acknowledges the receipt of Rs 10/- being the application fees for leave to file the specification of the invention referred to in sl: 1
4	(1) Sub[d] with a draft with reference to sl: 4 the report from the Registrar Mysore University may be awaited (2)
	(1) Done (2) Yes 23/1
	21.1.19
6	To The Superintendent of Stamps L 15732 of 28.1.19. Acknowledges the receipt of Stamps & power of attorney referred to in sl 4.
7	From The Registrar, Mysore University With reference to sl: 2 above forwards the opinion of Mr: T. L. Fisher, Professor, Central College &c. Submitted with the usual 2 drafts. The expert opinion is favourable Draft may be sanctd
	12.2.1919 Second Member 12/2/19
	4678-265 12-2-19 Drafts approved

NOTE—Contn. sheet.

M. B Hence forward such applications may be forwarded to the Board of Sc. advice for opinion

14.2.19

French Note

WD & 1789—GPB—60,000—20-8-18—S.

ISSUE & RESUBMIT.

CHIEF SECRETARIAT IV MINOR Depts. 30 JAN 1919

G. R. S. III-2.

13546 16854 (4)

General and Revenue Secretariat.

G.M. File No. 115 of 1918.

Serial No.	
8	To Mr John Nelson, Glasgow, Scotland G. 18094 of 21.2.1919 Authorises the applicant ref: to ... & / to file the Spec[ification] ... the invention ref: to therein Forwarded to ...
9	To Messrs Remfry & Son Calcutta G. 18095 of 21.2.1919. Forwarded to ...
10	From Messrs Remfrey and Son Letter of 19-3-19 Forwards Rs 30/- being the filing fees of the above invention together with 4 copies of the Specification and requests that the certificate at the foot of the G.O. authorising to file the specification may be filled in & forwarded. Fees for filing have been received. Submitted with the usual draft and the Treasury Remittance Register duly filled in. The certificate at the foot of the G.O. may be initialled & signed 24/3/19 24/3/19

Sanction

Flag Z

NOTE—Contn. sheet.

R. S. III-2]

D 16854

General and Revenue Secretariat.

G.In. File No. 115 of 1918.

Serial No.	
11	To the Compiler Mysore Gazette. G. 22514 D/ 4. 4. 1919. Notifies the filing of the Specification of the invention refd: to in Sl 1
12	To Messrs Remfry & Son Calcutta. G. 22515 D/ 4. 4. 1919. Forwards a copy of Sl. 11 for being sent to the party Concerned.
13	To The Supt dt: Govt: Museum. " - Chief Engineer in Mysore " Registrar Mysore University G. 22511 – 13 D/ 4. 4. 1919 Forwards for record in his office a copy of the Specification of the invention refd: to in Sl 1.
14	From the Huzur Treasury officer. Ty: Receipt No 148 D/ 31. 3. 1919 Acknowledges receipt of Rs 30 refd: to in Sl 10.

CHIEF SECRETARIAT
IV
MINOR Depts.
17 APR 1919

NOTE—Contn. sheet.

DIARY NO. 58706

REGISTERED.

To

THE ~~CONTROLLER OF PATENTS~~, SECY TO THE GOVT OF MYSORE,
~~PATENT OFFICE,~~ GENL. & REV. DEPTS
16398 ~~CALCUTTA.~~ BANGALORE,
MYSORE.

FROM

REMFRY & SON,
PATENT & TRADE-MARK ATTORNEYS,
CALCUTTA.

Dated CALCUTTA, the 28th November 1918.

DEPT.	P.	FILE LR.	M.
FILE INDICATION			
Mysore Pats. (Genl).			

SIR,

re J. NELSON. (MYSORE)

Brit. *No.* 116304 *dated* 13/3/17.

We have the honour to forward herewith an Application of JOHN NELSON, Merchant, of 86, St. Vincent Street, Glasgow, Scotland, for leave to file a Specification under Part I of the Mysore Inventions and Designs Regulation, 1894, in respect of an Invention for "PROCESS AND APPARATUS FOR THE 'CRACKING' OF HYDRO-"CARBON OILS AND THE LIKE", and solicit the favour of your submitting the same to H. H. the Dewan.

The Power of Attorney in our favour under which we are acting is also enclosed and we solicit the favour of your having same stamped Re.1/-.

The corresponding British Patent is No.116304 dated 13/3/17 and a Certified Copy of the Printed Specification of such British Patent is enclosed.

A Post Office Order for Rs. 11/- is sent today.

We have the honour to be,
Sir,
Your very obedient servants,

Enclos:-
Appln.
P/A. C/Copy Brit. P/Specn.116304.
By P.O.O:-
Rs. 11/-.

I.M.B.

P/O (Genl.) 1,000—7-6-18 [4-2-14—17-3-11].

G. R. S. VI.—s-v/16]

DRAFT. 2 Drafts

SUBJECT.....

.....

.....

Section. fm
File No. 115-18
Serial No. 2

Diary No. of letter replied to 8876

No. 13396
one

To
The Registrar, mysore
University
mysore

GENERAL AND REVENUE SECRETARIAT,
( )
the .....*191* .

Date of issue 6 1 19

Signed by Hvs Mw Dra

Has the honor to forward herewith ~~for report~~ under Sec. 6, Cl. (2) of the Mysore Inventions and Designs Regulation, XI of 1894, an application for leave to file a specification of an invention for "Process and apparatus for the Cracking of Hydrocarbon oils and the like" by John Nelson merchant, of 86, St Vincent Street Glasgow, Scotland, Calcutta and to request that the opinion of mr. F. L. Usher, Professor, Central college Bangalore may kindly be obtained and forwarded

By Order,

Jic 18/12

for Secretary to Government.

16/12/18

17/12/18

I Certify this, including the Drawing forming part thereof, to be a true Copy.
2 OCT. 1918
A. Halford
Acting for Comptroller.

Mysore

116,304

PATENT SPECIFICATION

Application Date, Mar. 13, 1917. No. 3668/17.
Complete Left, Sept. 12, 1917.
Complete Accepted, June 13, 1918.

PROVISIONAL SPECIFICATION.

Process and Apparatus for the "Cracking" of Hydrocarbon Oils and the like.

I, JOHN NELSON, Merchant, of 86, St. Vincent Street, Glasgow, Scotland, do hereby declare the nature of this invention to be as follows:—

The present invention relates to a method of and apparatus for "cracking" hydrocarbon oils and the like.

In processes heretofore employed for this purpose it has been customary to pass the hydrocarbon through retorts, tubular chambers or the like partly filled with solid contact-materials such as iron, nickel, or earthenware and heated to an appropriate temperature. In operating with solid contact-substances, however, it has been found that difficulties and irregularities of working are apt to occur, chiefly on account of the gradual accumulation of carbonaceous deposits in the interstices of the contact-material or at constricted parts of the chamber. A further disadvantage has been that, as a rule, it has not been easy to maintain a uniform temperature in the contact-material itself and the consumption of fuel for heating has been somewhat wasteful.

The object of the present invention is to obviate these difficulties and to improve the cracking process generally.

The invention consists essentially in using as contact-substance a suitable liquid material such as molten metal instead of the solid bodies hitherto employed the liquid being agitated, preferably by passage of the hydrocarbon vapours and gases through it.

The selection of the liquid substance to be used depends, among other considerations, upon the working temperature required. In operating at moderate temperatures (such as are employed in the production of volatile spirits for use in petrol engines) I prefer to use a bath of molten lead as the contact-substance, and to pass the hydrocarbon or its vapours into the bath at a suitable distance below its surface. The gases and vapours rushing up through the liquid metal keep it vigorously agitated; local accumulations of carbonaceous matter are prevented and the maintenance of a uniform temperature in the contact-substance is facilitated.

It will be understood that the liquid contact-substance comes directly into contact with the hydrocarbon itself and is not used merely as a means for the external heating of the contact-chamber.

[Price 6d.]

If the hydrocarbon to be cracked contains tarry matters or the like which cannot be wholly vaporised during the cracking process, it may be distilled from an auxiliary vessel and the distillate or vapours be then subjected to the cracking process.

The extent of the cracking may be varied by varying the depth at which the hydrocarbon or its vapours are delivered beneath the surface of the liquid contact-substance.

As the time during which the hydrocarbon and its products remain in contact with the hot liquid substance is very brief, the whole product or any desired fraction thereof may be subjected to one or more re-treatments; for example the heavier fraction, condensed out of the hot vapours by means of a dephlegmator in the known manner, may be thus re-treated.

Various forms of apparatus may be used for carrying out the process. One form, which has been found to operate satisfactorily with molten lead as the contact-substance, consists of a vertical cast-iron cylinder, about 2 feet 6 inches high and $2\frac{1}{2}$ inches internal diameter, closed at the lower end and provided at the upper end with a gas-tight cover and a lateral exit-pipe, 1 inch in diameter, for the vapours produced. Through the cover passes a vertically-adjustable oil-inlet pipe, $\frac{1}{2}$ inch in diameter, which extends down to near the bottom of the cylinder, its lower end being immersed in a quantity of molten lead (about 20—30 lb.) contained in the latter. The lower portion of the cylinder is set in a furnace heated by gas or oil burners or by solid fuel. The oil is fed through the inlet pipe by means of a pump or from a feed tank placed at a sufficient height. The inlet pipe is provided with a feed-valve, and preferably, a non-return valve to prevent the escape of vapours and a safety-valve or pressure gauge to guard against undue rise of pressure in case of accidental stoppage. The apparatus is preferably fitted with a pyrometer, the thermo-couple of which is immersed in the lead. It has been found that on treating kerosene of specific gravity 0.803, for example, in this apparatus, with molten lead at a temperature of about 700° C. and the oil inlet-pipe immersed in the lead to a depth of about 4 inches, the once-treated product yields about 20 *per cent.* of light spirit, of specific gravity 0.757, boiling at or below 160° C., and no formation of carbonaceous deposits in the lead has been observed.

Two or more such cylindrical apparatus may be arranged in series, with or without interposed dephlegmators, to facilitate the repeated treatment of the hydrocarbon, and the dimensions may be varied according to the rate of working desired. In larger forms of apparatus the cylinders may be made proportionately wider and may be provided with two or more oil inlet-pipes.

If temperatures exceeding those at which lead is satisfactorily used are to be adopted, metals or alloys of higher melting-point than lead may be used as contact-substance, and the apparatus may be constructed of fire-clay or other refractory material.

Another form of apparatus consists of a covered horizontal tank set in a furnace and containing a quantity of molten lead. The tank is provided with oil-inlet and vapour-outlet pipes and with a series of internal vertical partitions so arranged that the hydrocarbon vapours are caused to flow alternately up over and down under the partitions and thus to bubble up through the molten lead in the alternate compartments. To ensure a steady flow of the vapours, the lower edges of the alternate partitions may be serrated or provided with perforations for breaking up the vapours into small streams.

Dated this 13th day of March, 1917.

BOULT, WADE & TENNANT,
111 & 112, Hatton Garden, London, E.C.,
Chartered Patent Agents.

COMPLETE SPECIFICATION.

Process and Apparatus for the "Cracking" of Hydrocarbon Oils and the like.

I, JOHN NELSON, Merchant, of 86, St. Vincent Street, Glasgow, Scotland, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to a method of and apparatus for "cracking" hydrocarbon oils and the like.

In processes heretofore employed for this purpose it has been customary to pass the hydrocarbon through retorts, tubular chambers or the like partly filled with solid contact-materials such as iron, nickel, or earthenware and heated to an appropriate temperature. In operating with solid contact-substances, however, it has been found that difficulties and irregularities of working are apt to occur, chiefly on account of the gradual accumulation of carbonaceous deposits in the interstices of the contact-material or at constricted parts of the chamber. A further disadvantage has been that, as a rule, it has not been easy to maintain a uniform temperature in the contact-material itself and the consumption of fuel for heating has been somewhat wasteful.

The object of the present invention is to obviate these difficulties and to improve the cracking process generally.

The invention consists essentially in using as contact-substance a suitable liquid material such as molten metal instead of the solid bodies hitherto employed, the liquid being agitated, as for example by passage of the hydrocarbon vapours and gases through it.

The selection of the liquid substance to be used depends, among other considerations, upon the working temperature required. In operating at moderate temperatures (such as are employed in the production of volatile spirits for use in petrol engines) I prefer to use a bath of molten lead as the contact-substance, and to pass the hydrocarbon or its vapours into the bath at a suitable distance below its surface. The gases and vapours rushing up through the liquid metal keep it vigorously agitated; local accumulations of carbonaceous matter are prevented and the maintenance of a uniform temperature in the contact-substance is facilitated.

It will be understood that the liquid contact-substance comes directly into contact with the hydrocarbon itself and is not used merely as a means for the external heating of the contact-chamber. The cracking takes place solely in contact with the molten metal, or substantially so.

If the hydrocarbon to be cracked contains tarry matters or the like which cannot be wholly vapourised during the cracking process, it may be distilled from an auxiliary vessel and the distillate or vapours be then subjected to the cracking process.

The extent of the cracking may be varied by varying the depth at which the hydrocarbon or its vapours are delivered beneath the surface of the liquid contact-substance.

As the time during which the hydrocarbon and its products remain in contact with the hot liquid substance is very brief, the whole product or any desired fraction thereof may be subjected to one or more re-treatments; for example the heavier fraction, condensed out of the hot vapours by means of a dephlegmator in the known manner, may be thus re-treated.

Various forms of apparatus may be used for carrying out the process. One simple form, which has been found to operate satisfactorily with molten lead as the contact-substance, is shown diagrammatically in sectional elevation in Figure 1 of the accompanying drawings. It consists of a vertical cast-iron cylinder A, about 2 feet 6 inches high and $2\frac{1}{2}$ inches internal diameter, closed at the lower end and provided at the upper end with a gas-tight cover A^1 and a lateral exit-pipe A^2, 1 inch in diameter, for the vapours produced. Through the cover passes a vertically-adjustable oil-inlet pipe B, $\frac{1}{2}$ inch in diameter, which extends downwards into the cylinder, its lower end being immersed in a quantity of molten lead (about 20—30lb) E contained in the latter. The lower portion of the cylinder is set in a furnace (not shown in the drawing) heated by gas or oil burners or by solid fuel. The oil is fed through the inlet pipe by means of a pump or from a feed tank placed at a sufficient height. The inlet pipe is provided with a feed-valve and, preferably, a non-return valve to prevent the escape of vapours and a safety-valve or pressure gauge to guard against undue rise of pressure in case of accidental stoppage. The apparatus is preferably fitted with a pyrometer, the thermo-couple of which is immersed in the lead. It has been found that on treating kerosene of specific gravity 0.803, for example, in this apparatus, with molten lead at a temperature of about 700° C. and the oil inlet-pipe immersed in the lead to a depth of about 4 inches, the once-treated product yields about 20 *per cent.* of light spirit, of specific gravity 0.757, boiling at or below 160° C., and no formation of carbonaceous deposits in the lead has been observed.

Two or more such cylindrical apparatus may be arranged in series, with or without interposed dephlegmators, to facilitate the repeated treatment of the hydrocarbon, and the dimensions may be varied according to the rate of working desired. In larger forms of apparatus the cylinders may be made proportionately wider and may be provided with two or more oil inlet-pipes.

If temperatures exceeding those at which lead is satisfactorily employed are to be adopted, metals or alloys of higher melting-point than lead may be used as contact-substance, and the apparatus may be constructed of fire-clay or other refractory material.

Another form of apparatus consists of a covered horizontal tank set in a furnace and containing a quantity of molten lead. The tank is provided with oil-inlet and vapour-outlet pipes and with a series of internal vertical partitions so arranged that the hydrocarbon vapours are caused to flow alternately up over or down under the partitions and thus to bubble up through the molten lead in the alternate compartments. To ensure a steady flow of the vapours, the lower edges of the alternate partitions may be serrated or provided with perforations for breaking up the vapours into small streams.

A preferred apparatus of this type is shown diagrammatically in sectional elevation, cross-section, and plan respectively in Figures 2, 3 and 4 of the accompanying drawings. The covered horizontal tank F which is of V-shaped cross-section and into which the oil is fed under pressure through the inlet pipes K, contains a quantity of molten lead E and is provided with vapour outlet pipes L. The tank is divided into a series of compartments (of which four are shown in the drawing) by transverse partitions G having ports G^1 at the upper part for the passage of the hydrocarbon vapours, and these compartments are further divided by a series of depending partitions H, the lower parts of which are curved and immersed to a suitable depth in the molten lead as shown. The hydrocarbon vapours are by this arrangement caused to pass through the apparatus in the direction shown by the arrows and are subjected repeatedly to the action of the molten lead. The V-shaped cross-section of the tank is specially advantageous when two or more such units are mounted side by side in one furnace.

Figures 5 and 6 show, in sectional elevation and plan respectively, a modified arrangement in which the horizontal tank C, which is preferably of V-shaped

cross-section, is provided with a series of vertical cylindrical chambers A, open at their lower ends and extending downwards through the cover C^1 nearly to the bottom of the molten lead E contained in the tank. Each cylinder is closed at the top by a cover A^1, fitted with an oil or vapour inlet pipe B, which extends downwards into the molten lead, and a vapour outlet pipe B^1 which connects with the inlet pipe of the adjacent chamber. Inspection plugs D are provided in the pipes B^1. The quantity of lead in the tank, and the depths to which the cylinders A and inlet pipes B are respectively immersed in the lead, must be so adjusted as to ensure that the hydrocarbon vapours flow in succession from cylinder to cylinder through the connecting pipes B^1, and pass out by the outlet pipe A^2, as indicated diagrammatically by the arrows, and do not escape beneath the lower edges of any of the cylinders. A filling plug F for the molten lead is provided in the cover of the tank. To prevent oxidation of the lead, atmospheric air may be expelled from the tank by means of a reducing or indifferent gas or vapour; for example by introducing hydrocarbon oil or vapour through the inlet C^2 and driving out the air through the outlet C^3.

Figures 7 and 8 show, in sectional elevation and cross-section respectively, a modified arrangement in which the molten lead completely fills the covered tank C, and the vertical cylinders A, which are closed at their upper ends by the covers A^1, are connected by means of vapour pipes A^2, A^3, and provided internally with vertical partitions A^4 which extend downwards for a short distance into the molten lead. The cylinders A extend downwards nearly to the bottom of the lead. The depths to which the cylinders A and partitions A^4 are respectively immersed in the lead must be so chosen as to ensure that the hydrocarbon vapours flow through the apparatus as indicated diagrammatically by the arrows. The lower edges A^5 of the partitions may be serrated as shown in Figure 8. A chamber D, formed in the cover C^1 and communicating with the interior of the tank C, provides space for the expansion and contraction of the molten metal whilst minimising the risk of oxidation thereof. A plug D^1 gives access to the chamber for inspection or filling purposes.

It will be obvious that the apparatus shown in Figures 5 and 6 may be modified by substituting, for the form of tank therein shown, a tank completely filled with molten lead as indicated in Figures 7 and 8.

The apparatus must in all cases be free from constrictions, interstices, or long channels of small cross-section, capable of being obstructed by carbonaceous deposits, at parts where high temperatures are reached.

It has already been proposed to employ molten metal as a heating agent in the distillation of oils, oil residues, tar oils and other volatile substances—particularly those which when treated by the usual distillation methods leave a non-volatile residue. For example, it has been proposed to force the oil or other volatile substances at constant rate and considerable velocity through a coiled pipe at least twenty feet long and of narrow bore (about three-sixteenths of an inch diameter), heated externally by means of a bath of molten lead or other metal to a temperature sufficiently high to evaporate the constituent having the highest boiling point, a separating chamber, immersed in the molten metal, being provided at the outlet of the coiled pipe for the separation of any unvaporised residue. In a proposed alternative form of apparatus the coiled pipe opened under the molten lead and at the bottom thereof; the oil was thus heated during its passage through the coil and in rising through the molten metal it became further heated and vaporised without fractionation. The object and effect of this process were to obtain continuously and uniformly either a distillate or vapour of constant composition, the volatile portion of the oil as it flowed through the apparatus being vaporised as a whole instead of being distilled over in fractions of progressively increasing density, as in distillation by the usual methods.

The present invention, however, relates to the cracking of oils and not to the mere vaporization thereof and it is an essential feature that the oil or

vapours shall at no time be subjected to a cracking temperature in long or constricted pipes or other narrow channels, since the accumulation of carbonaceous deposits, which it is the object of the invention to avoid, would inevitably occur therein. It is of the essence of the invention that the cracking shall take place solely in contact with the mobile metal itself, or substantially so, in order that the constant, vigorous movement of the metal will prevent mechanically any local accumulations of deposit. I disclaim the use of molten metal in either the fractional or non-fractional vaporisation of oils.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. The method of cracking hydrocarbon oils and the like consisting in passing the hydrocarbon or its vapours through an agitated liquid contact-substance, such as molten lead, in an apparatus free from constrictions or long highly-heated channels.

2. In the cracking of hydrocarbon oils and the like according to Claiming-clause No. 1, the use as contact-substance of a liquid material such as molten metal, the liquid material being agitated, as for example by passage of the hydrocarbon vapours and gases through it, substantially as and for the purpose described.

3. In the cracking of hydrocarbon oils and the like according to Claiming-clause No. 1 for the production of motor fuel, the use of molten lead as contact-subtance, substantially as and for the purpose described.

4. The method of cracking hydrocarbon oils and the like containing tarry matters, according to Claiming-clause No. 1, wherein the said hydrocarbon is distilled from an auxiliary vessel, and the distillate or vapours are led through a liquid contact-substance such as molten lead, substantially as and for the purpose described.

5. Apparatus for cracking hydrocarbon oils and the like consisting of a vertical externally-heated cylinder of cast-iron, charged with molten lead and fitted with oil inlet and vapour outlet pipes, the apparatus being free from constrictions or long, highly-heated channels, substantially as described with reference to Figure 1 of the accompanying drawings.

6. Apparatus for the cracking of hydrocarbon oils and the like consisting of a horizontal externally-heated covered tank, charged with molten lead and provided with internal vertical partitions, oil inlet pipes and vapour outlet pipes, the apparatus being free from constrictions or long highly-heated channels, substantially as and for the purpose described.

7. Apparatus for the cracking of hydrocarbon oils and the like consisting of one or more horizontal externally-heated covered tanks of V-shaped cross-section, partly filled with molten lead and provided with oil inlet pipes and vapour outlet pipes, each tank being divided into a series of compartments by transverse partitions having ports at the top for the passage of hydrocarbon vapours, the said compartments being further divided by a series of depending partitions the lower parts of which are curved and immersed in the molten lead, all substantially as described with reference to Figures 2, 3 and 4 of the accompanying drawings.

8. Apparatus for the cracking of hydrocarbon oils and the like consisting of one or more horizontal externally-heated covered tanks of V-shaped cross-section, partly filled with molten lead and provided with a series of vertical covered cylinders, open at their lower ends and fitted with inlet, connecting and outlet pipes, the lower ends of the said cylinders and inlet pipes being immersed in the molten lead, and means for displacing the atmospheric air from above the lead in the tanks, all substantially as described with reference to Figures 5 and 6 of the accompanying drawings.

9. Apparatus for the cracking of hydrocarbon oils and the like consisting of

one or more horizontal externally-heated covered tanks of V-shaped cross-section, completely filled with molten lead and provided with expansion chambers for the lead, each tank having a series of vertical covered cylinders open at their lower ends and connected by means of vapour pipes, the said cylinders being provided internally with vertical partitions and depending into the molten lead, all substantially as described with reference to Figures 7 and 8 of the accompanying drawings.

10. Apparatus according to Claiming-clause No. 8 in which each tank is completely filled with molten lead and is provided with an expansion chamber for the lead, substantially as described.

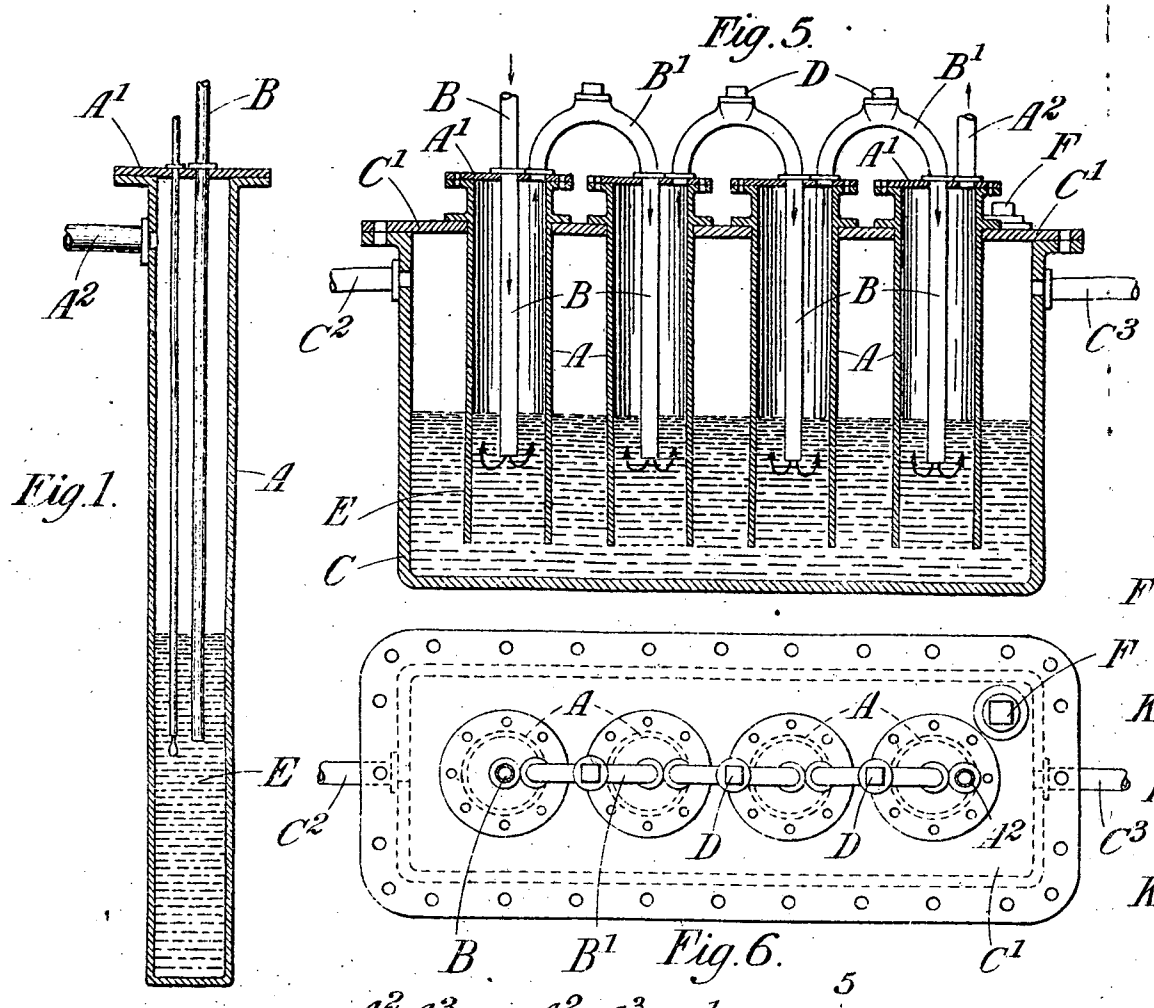
11. Apparatus for the cracking of hydrocarbon oils and the like wherein two or more cracking chambers connected in series and open at their lower ends are immersed at their lower ends in a bath of the contact fluid common to all the chambers, substantially as and for the purpose described.

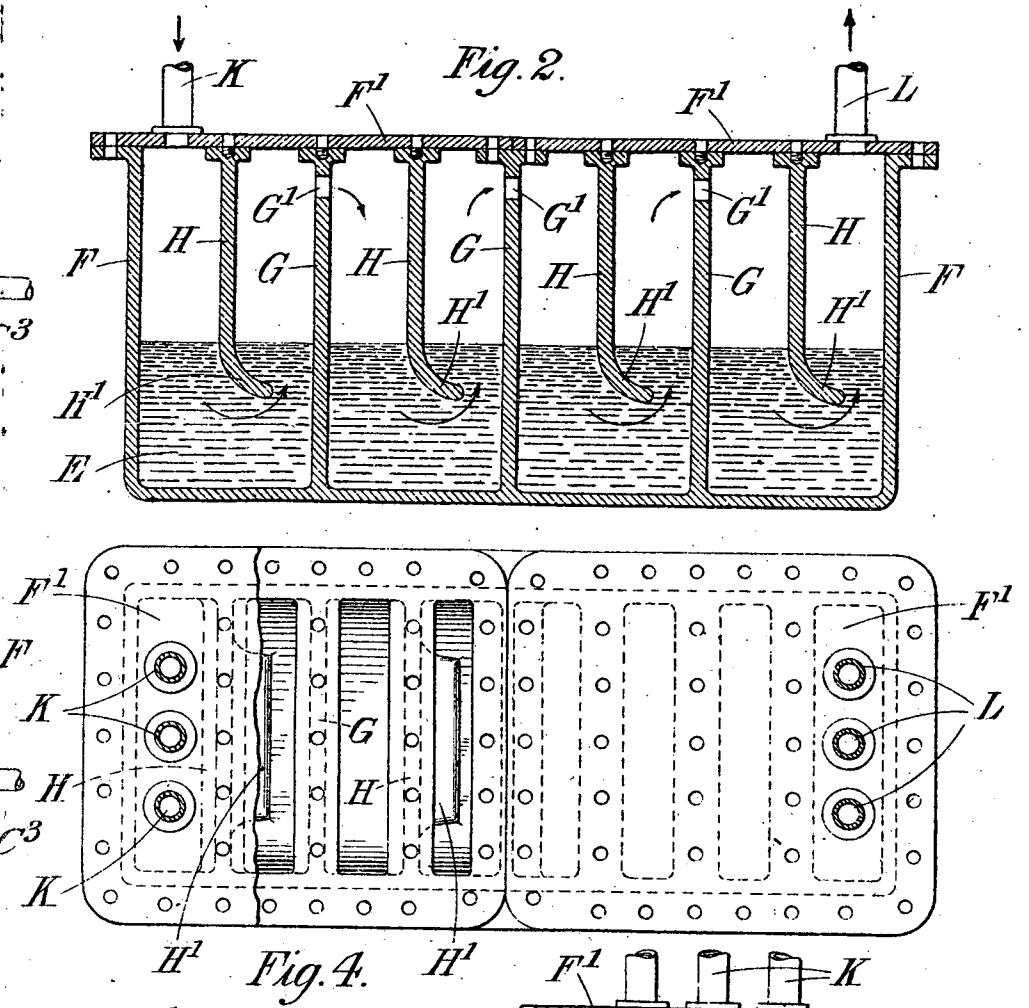
Dated this 12th day of September, 1917.

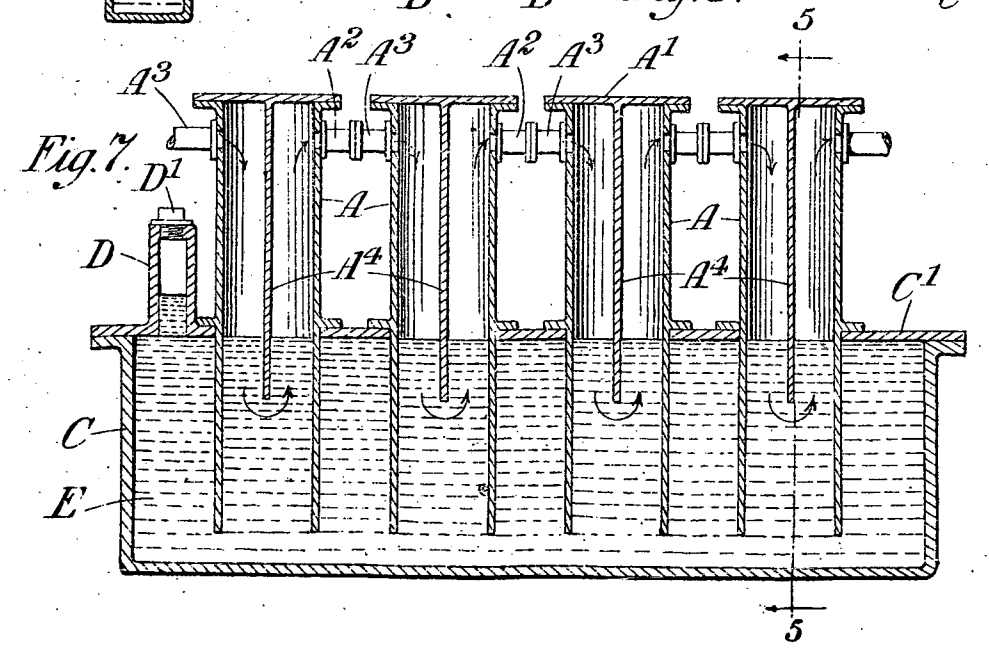
BOULT, WADE & TENNANT,
111 & 112, Hatton Garden, London, E.C. 1,
Chartered Patent Agents.

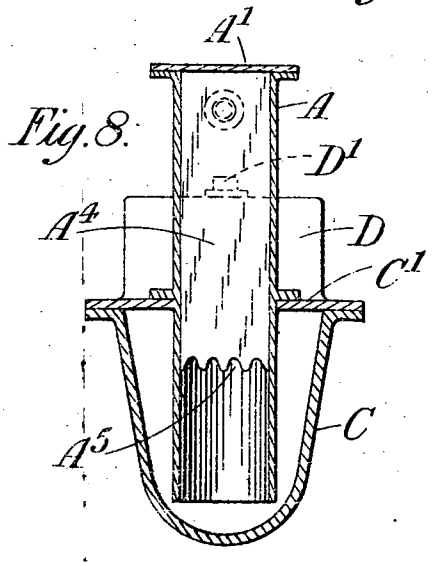
Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1918.

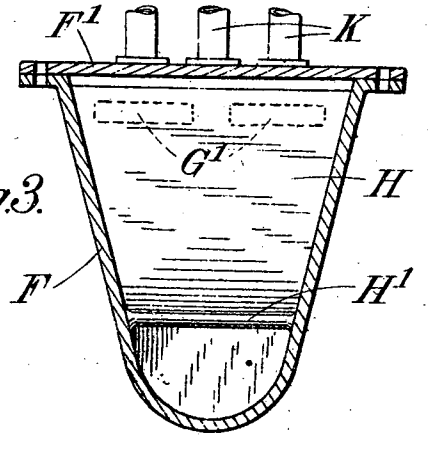
[This Drawing is a reproduction of the Original on a reduced scale.]











G. R. S. VI—s.v/14]

DRAFT.

SUBJECT.....

.....

.....

Section. for
File No. 115-18
Serial No. 3

Diary No. of letter replied to 8876

GENERAL AND REVENUE SECRETARIAT
( )
, the .....191 .

Date of issue 6.1.19.

Signed by .....

To

The Superintendent of
Stamps, Mysore
Bangalore

Has the honor to forward herewith a Power of Attorney executed by John Nelson merchant of 86, St Vincent Street, Glasgow Scotland constituting messrs Remfry & Son, Patent & Trade mark Attorneys, Calcutta as Agents in respect of ~~their~~ his invention for Process and Apparatus for the Cracking of Hydrocarbon oils & the like and to request that the same may be impressed with the Mysore General Stamp of the value of Rupee One, also herewith forwarded, and the Power returned to this office.

By Order,

For Chief Secretary to Government.

Stamp 39]

WD 02702—GPB—300—16-2-17

No. 98/172
Enc. Nil

OFFICE OF THE SUPERINTENDENT OF STAMPS IN MYSORE,

Bangalore, dated 10th January 1919.

21639

FROM M. Srinivasamurti, ESQ.,

DIARY NO. 11486

Superintendent of Stamps in Mysore.

G.M. 115-18: 4

To

C. S. Balasundaram Iyer, ESQ., B. A.,
Chief Secretary to the
Government of H. H. the Maharaja
of Mysore, Bangalore

SIR,

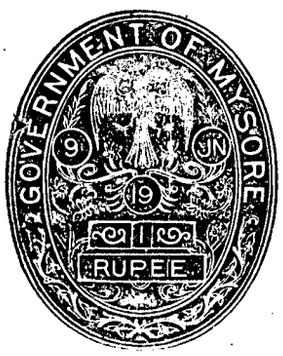
I have the honor to return the Power of Attorney forwarded with your letter No: G. 13397 dated G.M. 115-18-3 6th Instant, duly stamped and to request the favor of an acknowledgment

I have the honor to be
Sir
Your most obedient Servant

M. Srinivasamurti

Superintendent of Stamps
in Mysore

MYSORE.



POWER OF ATTORNEY.

IN THE MATTER of the Inventions and Designs Regulation, 1894, of the Government of Mysore,

and

IN THE MATTER of JOHN NELSON, Merchant, of 86, St. Vincent Street, Glasgow, Scotland, an Inventor.

I, the above named JOHN NELSON do hereby retain, constitute and appoint the Partners or Partner for the time being of the Firm of REMFRY & SON, of Calcutta, British India, as my Agents and Attorneys to apply for and obtain from the Government of Mysore and keep in force an Exclusive Privilege or Letters Patent for "PROCESS AND APPARATUS FOR THE CRACKING OF HYDROCARBON OILS AND THE LIKE" and I authorise them or either of themto sign my name to such papers and writings and do such acts regarding the same, including the appointment of a substitute or substitutes, as may be necessary or expedient.

23/9/14

Dated this 23rd day of September 1918.

SIGNED, SEALED and DELIVERED at London, England in the presence of:-

John Nelson

2 Witnesses:-

Harry B Speight

Ernest Hotson

G. M. 115 - 18 - 5

Duplicate.

(To be returned to the General and Revenue Secretariat for being placed in the file.)

1. No. 115

2. Date of Remittance 17-12-1918

3. From whom received Messrs. Remfry & Son's Patents & Trade mark Attorneys Calcutta

4. Date of receipt of amount in the General and Revenue Secretariat 2-12-1918

5. On what account Application fee for leave to file a specification of an invention no 64 (1918-19) by John Nelson of 86, St Vincent Street, Glasgow, merchant

6. Amount (in figures and words) Rs 15/- Rupees Fifteen only

7. The head to which it should be credited.

.....

(To be filled in by the Treasury.)

M Venkatasubbaiya

Actg *Secretary to Government,*

~~General Department~~

The above amount has been duly received and credited in the Treasury on this date.

Date 16/1/19

Hd. Acctt. *Treasurer.* *Try. Officer.*

N. B.—Both the counterfoil and the duplicate to be returned to the General and Revenue Secretariat duly signed by the Treasury Department.

(13

G. R. S. VI—G/32]

SUBJECT.....

.....

.....

Diary No. of letter replied to.....11486

GENERAL AND REVENUE SECRETARIAT,

( )

, the *191*

Date of issue.....25/1/19

Signed, by.....

Section Jn

File No. 115-18

Serial No. 6.

No. G 15/32

To

The Superintendent of Stamps

Sir

I am directed to forward
acknowledge the receipt
of the power of Attorney forwarded
with your letter no G B 172 of the
11th January 1919

I have etc

for Chief Secy

21/1/19

over.

14/1

List of enclosure

Copied by

Examined by

WD 86—GPB—60,000—15-11 16

GBPM—1,500—17-1-19.

No. 6785 Encls (3).

Office of the Mysore University,

Dated Mysore, 7th February *1919*

57916

135246

DIARY NO.....

FROM

THOS DENHAM, ESQ., M.A.,
Registrar, Mysore University,
Mysore.

G.M. 115-18

7

C.S. Balasundaram Iyer, Esq., B.A.,
Chief Secretary to the Government of
His Highness the Maharaja of Mysore,
Bangalore.

Sir,

With reference to your docket No.G.13396/G.M.115-18-2 date 6th January 1919, I am directed to forward herewith a copy of Mr. Usher's letter dated 25th January 1919 to the Principal, Central College, furnishing his opinion on the application for leave to fil a specification of an invention for Process and Apparatus for the cracking of Hydro Carbon oils and the like "by John Nelson, Merchan of 86, St. Vincent Street, Glasgow, Scotland.

The application with its enclosure is returned herewith.

I have the honour to be,

Sir,

Your most obedient servant,

Thos Denham

REGISTRAR.

MSR.

Letter No.nil dated 25th January 1919 from Mr. F.L. Usher, to the Principal, Central College, Bangalore.

I have the honour to return herewith the application of John Nelson of Glasgow for leave to file a specification of an invention for "Process and apparatus for the cracking of Hydrocarbon oils and the like". and to state that after examining the said specification I am of opinion that the permission sought may be granted.

******

COPY.

REGISTRAR.

MSR.

MYSORE.

A P P L I C A T I O N.

To THE DEWAN OF MYSORE.

The Application of JOHN NELSON, Merchant, of 86, St. Vincent Street, Glasgow, Scotland, for leave to file a Specification under Part I of the Mysore Inventions and Designs Regulation, 1894.

I. The Applicant is in possession of an Invention for "PROCESS AND APPARATUS FOR THE 'CRACKING' OF HYDROCARBON OILS AND THE LIKE"; he is the Inventor thereof; and to the best of his information and belief, the Invention is new within the meaning of Part I of the Inventions and Designs Regulation, 1894, and no circumstance exists which, if the Applicant is authorised to file a Specification and files it in accordance with that Part, will disentitle him to an Exclusive Privilege thereunder in respect of the Invention.

The Applicant has applied for a Patent in the United Kingdom in respect of this Invention, No. 3668, dated the 13th day of March 1917. See Illustrated Official Journal (Patents) No. 1470, page 232. Complete Specification filed 12th day of September, 1917, and accepted on the 13th day of June 1918. See Journal No. 1535, page 543.

The Applicant has applied for a Patent in British India in respect of this Invention, No. 3555, dated the 21st day of February 1918, still pending.

2. The following is a description of the Invention:-

The present invention relates to a method of and apparatus for "cracking" hydrocarbon oils and the like.

In processes heretofore employed for this purpose it has been customary to pass the hydrocarbon through retorts, tubular chambers or the like partly filled with solid contact-materials, such as iron, nickel, or earthenware and heated to an appropriate temperature. In operating with solid contact-substances, however, it has been found that difficulties and irregularities of working are apt to occur, chiefly on account of the gradual accumulation of carbonaceous deposits in the interstices of the contact-material or at constricted parts of the chamber. A further disadvantage has been that, as a rule, it has not been easy to maintain a uniform temperature in the contact-material itself and the consumption of fuel for heating has been somewhat wasteful.

The object of the present invention is to obviate these difficulties and to improve the cracking process generally.

The invention consists essentially in using as contact-substance a suitable liquid material, such as molten metal, instead of the solid bodies hitherto employed, the liquid being agitated, as for example by passage of the hydrocarbon vapours and gases through it.

The selection of the liquid substance to be used depends, among other considerations, upon the working temperature required. In operating at moderate temperatures (such as are employed in the

production of volatile spirits for use in petrol engines) I prefer to use a bath of molten lead as the contact-substance, and to pass the hydrocarbon or its vapours into the bath at a suitable distance below its surface. The gases and vapours rushing up through the liquid metal keep it vigorously agitated; local accumulations of carbonaceous matter are prevented and the maintenance of a uniform temperature in the contact-substance is facilitated.

It will be understood that the liquid contact-substance comes directly into contact with the hydrocarbon itself and is not used merely as a means for the external heating of the contact-chamber. The cracking takes place solely in contact with the molten metal, or substantially so.

If the hydrocarbon to be cracked contains tarry matters or the like which cannot be wholly vapourised during the cracking process, it may be distilled from an auxiliary vessel and the distillate or vapours be then subjected to the cracking process.

The extent of the cracking may be varied by varying the depth at which the hydrocarbon or its vapours are delivered beneath the surface of the liquid contact-substance.

As the time during which the hydrocarbon and its product remain in contact with the hot liquid substance is very brief, the whole product or any desired fraction thereof may be subjected to one or more re-treatments, for example the heavier fraction, condensed out of the hot vapours by means of a dephlegmator in the known manner, may be thus retreated.

Various forms of apparatus may be used for carrying out the process. One simple form, which has been found to operate satisfactorily with molten lead as the contact-substance, is shown diagrammatically in sectional elevation in Figure 1 of the accompanying drawings. It consists of a vertical cast-iron cylinder A, about 2 feet 6 inches high and 2½ inches internal diamater, closed at the lower end and provided at the upper end with a gas-tight cover A^1 and a lateral exit-pipe A^2, 1 inch in diameter, for the vapours produced. Through the cover passes a vertically-adjustable oil-inlet pipe B, ½ inch in diameter, which extends downwards into the cylinder, its lower end being immersed in a quantity of molten lead (about 20-30 lb.) E contained in the latter. The lower portion of the cylinder is set in a furnace (not shown in the drawing) heated by gas or oil burners or by solid fuel. The oil is fed through the inlet pipe by means of a pump or from a feed tank placed at a sufficient height. The inlet pipe is provided with a feed-valve and, preferably, a non-return valve to prevent the escape of vapours and a safety-valve or pressure gauge to guard against undue rise of pressure in case of accidental stoppage. The apparatus is preferably fitted with a pyrometer, the thermo-couple of which is immersed in the lead. It has been found that on treating kerosene of specific gravity 0.803, for example, in this apparatus, with molten lead at a temperature of about 700° C. and the oil inlet-pipe immersed in the lead to a depth of about 4 inches, the once-treated product yields about 20 per cent of light spirit, of specific gravity 0.757, boiling at or below 150° C., and no formation of carbonaceous deposits in the lead has been observed.

Two or more such cylindrical apparatus may be arranged in series, with or without interposed dephlegmators,

to facilitate the repeated treatment of the hydrocarbon, and the dimensions may be varied according to the rate of working desired. In larger forms of apparatus the cylinders may be made proportionately wider and may be provided with two or more oil inlet-pipes.

If temperatures exceeding those at which lead is satisfactorily employed are to be adopted, metals or alloys of higher melting-point than lead may be used as contact-substance and the apparatus may be constructed of fireclay or other refractory material.

Another form of apparatus consists of a covered horizontal tank set in a furnace and containing a quantity of molten lead. The tank is provided with oil-inlet and vapour-outlet pipes and with a series of internal vertical partitions so arranged that the hydrocarbon vapours are caused to flow alternately up over or down under the partitions and thus to bubble up through the molten lead in the alternate compartments. To ensure a steady flow of the vapours, the lower edges of the alternate partitions may be serrated or provided with perforations for breaking up the vapours into small streams.

A preferred apparatus of this type is shown diagrammatically in sectional elevation, cross-section, and plan respectively in Figures 2, 3 and 4 of the accompanying drawings. The covered horizontal tank F which is of V-shaped cross-section and into which the oil is fed under pressure through the inlet pipes K, contains a quantity of molten lead E and is provided with vapour outlet pipes L. The tank is divided into a series of compartments (of which four are shown in the drawing) by transverse partitions G having ports G^1 at the upper part for the passage of the hydrocarbon vapours, and these compartments are further divided by a series of

depending partitions H, the lower parts of which are curved and immersed to a suitable depth in the molten lead as shown. The hydrocarbon vapours are by this arrangement caused to pass through the apparatus in the direction shown by the arrows and are subjected repeatedly to the action of the molten lead. The V-shaped cross-section of the tank is specially advantageous when two or more such units are mounted side by side in one furnace.

Figures 5 and 6 show, in sectional elevation and plan respectively, a modified arrangement in which the horizontal tank C, which is preferably of V-shaped cross-section, is provided with a series of vertical cylindrical chambers A, open at their lower ends and extending downwards through the cover C^1 nearly to the bottom of the molten lead E contained in the tank. Each cylinder is closed at the top by a cover A^1, fitted with an oil or vapour inlet pipe B, which extends downwards into the molten lead, and a vapour outlet pipe B^1 which connects with the inlet pipe of the adjacent chamber. Inspection plugs D are provided in the pipes B^1. The quantity of lead in the tank, and the depths to which the cylinders A and inlet pipes B are respectively immersed in the lead, must be so adjusted as to ensure that the hydrocarbon vapours flow in succession from cylinder to cylinder through the connecting pipes B^1, and pass out by the outlet pipe A^2, as indicated diagrammatically by the arrows, and do not escape beneath the lower edges of any of the cylinders. A filling plug F for the molten lead is provided in the cover of the tank. To prevent oxidation of the lead, atmospheric air may be expelled from the tank by means of a reducing or indifferent gas or vapour; for

example by introducing hydrocarbon oil or vapour through the inlet C^2 and driving out the air through the outlet C^3.

Figures 7 and 8 show, in sectional elevation and cross-section respectively, a modified arrangement in which the molten lead completely fills the covered tank C, and the vertical cylinders A, which are closed at their upper ends by the covers A^1, are connected by means of vapour pipes A^2, A^3, and provided internally with vertical partitions A^4 which extend downwards for a short distance into the molten lead. The cylinders A extend downwards nearly to the bottom of the lead. The depths to which the cylinders A and partitions A^4 are respectively immersed in the lead must be so chosen as to ensure that the hydrocarbon vapours flow through the apparatus as indicated diagrammatically by the arrows. The lower edges A^5 of the partitions may be serrated as shown in Figure 8. A chamber D, formed in the cover C^1 and communicating with the interior of the tank C, provides space for the expansion and contraction of the molten metal whilst minimising the risk of oxidation thereof. A plug D^1 gives access to the chamber for inspection or filling purposes.

It will be obvious that the apparatus shown in Figures 5 and 6 may be modified by substituting, for the form of tank therein shown, a tank completely filled with molten lead as indicated in Figures 7 and 8.

The apparatus must in all cases be free from constrictions, interstices, or long channels of small cross-section, capable of being obstructed by carbonaceous deposits, at parts where high temperatures are reached.

It has already been proposed to employ molten metal as a heating agent in the distillation of oils, oil residues, tar oils and other volatile substances - particularly those which when treated by the usual distillation methods leave a non-volatile residue. For example, it has been proposed to force the oil or other volatile substances at constant rate and considerable velocity through a coiled pipe at least twenty feet long and of narrow bore (about three-sixteenths of an inch diameter), heated externally by means of a bath of molten lead or other metal to a temperature sufficiently high to evaporate the constituent having the highest boiling point, a separating chamber, immersed in the molten metal, being provided at the outlet of the coiled pipe for the separation of any unvaporised residue. In a proposed alternative form of apparatus the coiled pipe opened under the molten lead and at the bottom thereof; the oil was thus heated during its passage through the coil and in rising through the molten metal it became further heated and vapourised without

fractionation. The object and effect of this process were to obtain continuously and uniformly either a distillate or vapour of constant composition, the volatile portion of the oil as it flowed through the apparatus being vapourised as a whole instead of being distilled over in fractions of progressively increasing density, as in distillation by the usual methods.

The present invention, however, relates to the cracking of oils and not to the mere vapourisation thereof, and it is an essential feature that the oil or vapours shall at no time be subjected to a cracking temperature in long or constricted pipes or other narrow channels, since the accumulation of carbonaceous deposits, which it is the object of the invention to avoid, would inevitably occur therein. It is of the essence of the invention that the cracking shall take place solely in contact with the mobile metal itself, or substantially so, in order that the constant, vigorous movement of the metal will prevent mechanically any local accumulations of deposit. I disclaim the use of molten metal in either the fractional or non-fractional vapourisation of oils.

HAVING NOW particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:-

1. The method of cracking hydrocarbon oils and the like consisting in passing the hydrocarbon or its vapours through an agitated liquid contact-substance, such as molten lead, in an apparatus free from constrictions or long highly-heated channels.

2. In the cracking of hydrocarbon oils and the like according to Claiming-clause No. 1, the use as contact-substance of a liquid material such as molten metal, the liquid material being agitated, as for example by passage of the hydrocarbon vapours and gases through it, substantially as and for the purpose described.

3. In the cracking of hydrocarbon oils and the like according to Claiming-clause No. 1 for the production of motor fuel, the use of molten lead as contact-substance substantially as and for the purpose described.

4. The method of cracking hydrocarbon oils and the like containing tarry matters, according to Claiming-clause No. 1, wherein the said hydrocarbon is distilled from an auxiliary vessel, and the distillate or vapours are led through a liquid contact-substance such as molten lead, substantially as and for the purpose described.

5. Apparatus for cracking hydrocarbon oils and the like consisting of a vertical externally-heated

cylinder of cast-iron, charged with molten lead and fitted with oil inlet and vapour outlet pipes, the apparatus being free from constrictions or long, highly-heated channels, substantially as described with reference to Figure 1 of the accompanying drawings.

6. Apparatus for the cracking of hydrocarbon oils and the like consisting of a horizontal externally-heated covered tank, charged with molten lead and provided with internal vertical partitions, oil inlet pipes and vapour outlet pipes, the apparatus being free from constrictions or long highly-heated channels, substantially as and for the purpose described.

7. Apparatus for the cracking of hydrocarbon oils and the like consisting of one or more horizontal externally-heated covered tanks of V-shaped cross-section, partly filled with molten lead and provided with oil inlet pipes and vapour outlet pipes, each tank being divided into a series of compartments by transverse partitions having ports at the top for the passage of hydrocarbon vapours, the said compartments being further divided by a series of depending partitions the lower parts of which are curved and immersed in the molten lead, all substantially as described with reference to Figures 2, 3 and 4 of the accompanying drawings.

8. Apparatus for the cracking of hydrocarbon oils and the like consisting of one or more horizontal externally-heated covered tanks of V-shaped cross-section partly filled with molten lead and provided with a series

of vertical covered cylinders, open at their lower ends and fitted with inlet, connecting and outlet pipes, the lower ends of the said cylinders and inlet pipes being immersed in the molten lead, and means for displacing the atmospheric air from above the lead in the tanks, all substantially as described with reference to Figures 5 and 6 of the accompanying drawings.

9. Apparatus for the cracking of hydrocarbon oils and the like, consisting of one or more horizontal externally-heated covered tanks of V-shaped cross-section, completely filled with molten lead and provided with expansion chambers for the lead, each tank having a series of vertical covered cylinders open at their lower ends and connected by means of vapour pipes, the said cylinders being provided internally with vertical partitions and depending into the molten lead, all substantially as described with reference to Figures 7 and 8 of the accompanying drawings.

10. Apparatus according to Claiming-clause No. 8 in which each tank is completely filled with molten lead and is provided with an expansion chamber for the lead, substantially as described.

11. Apparatus for the cracking of hydrocarbon oils and the like wherein two or more cracking chambers connected in series and open at their lower ends are immersed at their lower ends in a bath of the contact fluid common to all the chambers, substantially as and for the purpose described.

JR.
MM.

3. The Applicant, therefore applies for leave to file a Specification of the Invention pursuant to Part I of the Mysore Inventions and Designs Regulation, 1894.

Dated this 23rd day of September 1918.

John Nelson

I, JOHN NELSON, the Applicant above named do declare that what is stated in this Application is true to my knowledge, except as to matters stated on information and belief, and as to those matters I believe them to be true.

John Nelson

Fig.1.

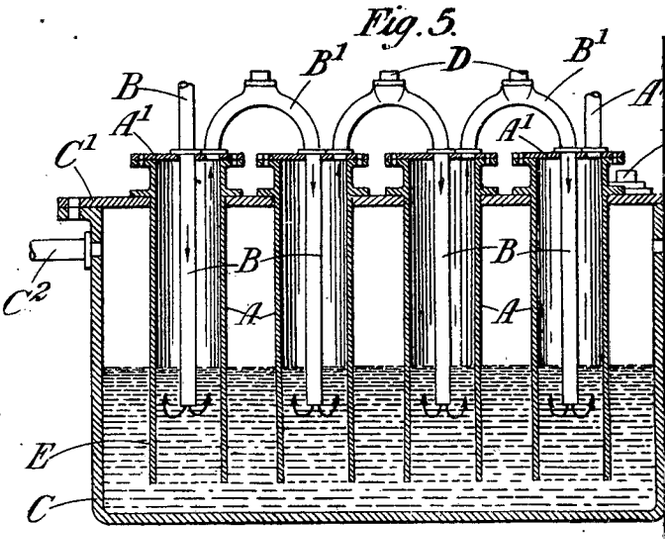


Fig.5.

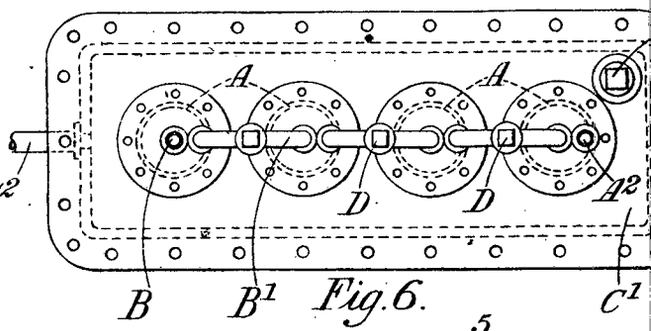


Fig.6.

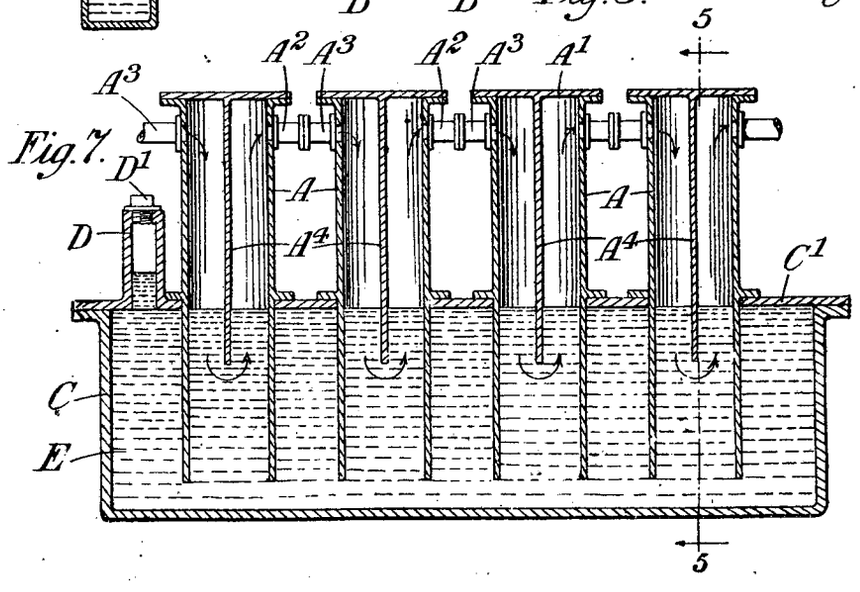


Fig.7.

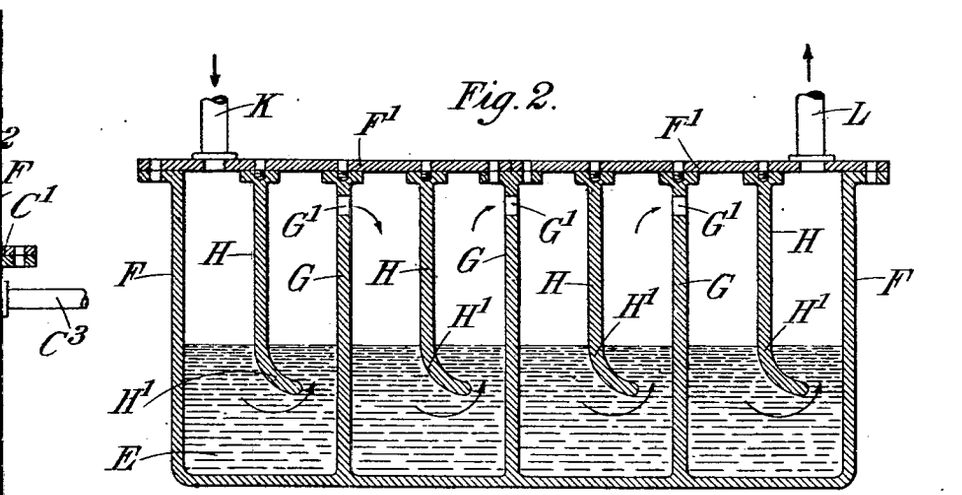


Fig. 2.

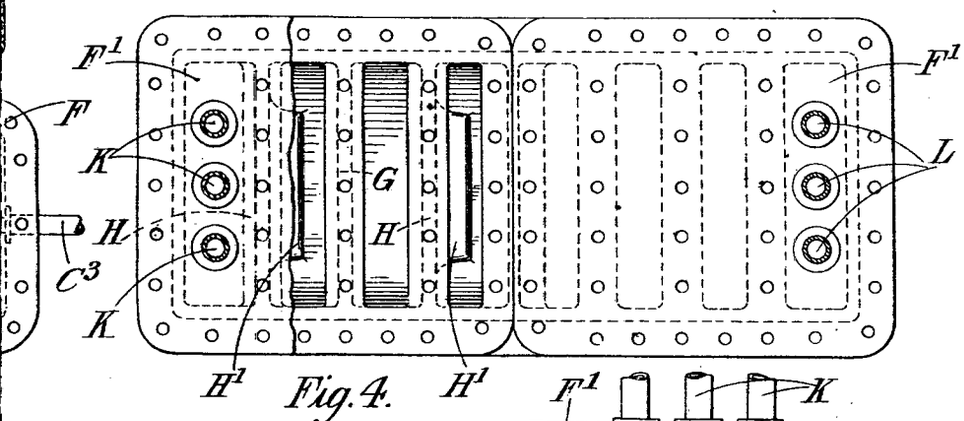


Fig. 4.

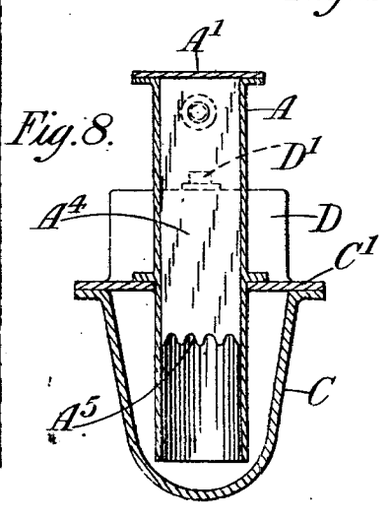


Fig. 8.

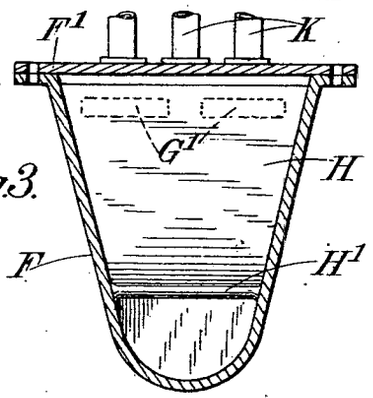


Fig. 3.

2 Drgs

G180994

G. R. S.VI—s.-v/21]

G.M. 115-18-8

Government of Mysore.

GENERAL DEPARTMENT.

Register No. 6 **of** 1918-19

Bangalore, the 21-2-1919.

WHEREAS an application, dated the 28th November 1918 and received on the 3rd December 1918, has been submitted under Section 5 of the Mysore Inventions and Designs Regulation, 1894, by Mr. John Nelson, merchant of 86, St. Vincent Street Glasgow, Scotland

(hereinafter referred to as "the applicant") for leave to file a specification of an invention for "Process and apparatus for the 'Cracking' of Hydrocarbon oils and the like"

And whereas the applicant has duly complied with all the requirements of Section 5 of the said Regulation;

The Government of Mysore are pleased, under Section 6 of the said Regulation, to authorize the applicant to file a specification of the said invention in accordance with the provisions of the said Regulation.

ORDERED, that the applicant be, and he is hereby, informed accordingly.

By Order of the Government of Mysore,

12/2

for Chief *Secretary to the Govt. of Mysore,*
~~General Department~~

Certified that the fees prescribed in the fourth schedule to the Mysore Inventions and Designs Regulation, 1894, in respect of the application for leave to file the said specification and of the filing thereof have been paid by the applicant, and that the specification hereinbefore described has been duly filed in accordance with the provisions of Section 8 of the said Regulation on this the Twenty-seventh day of March 1919.

for Chief *Secretary to the Govt. of Mysore,*
~~General Department.~~

(Section 8 of the Inventions and Designs Regulation, 1894.)

8. (1) If within six months from the date of an order under Section 6, Sub-Section (1), or within such further time, not exceeding three months, as the Government of Mysore, in its discretion, may, on cause shown to its satisfaction and on payment of the fee prescribed in that behalf in the fourth schedule, see fit to allow, the applicant causes a specification of his invention to be filed in manner by this Part required, and the fee prescribed in the fourth schedule in respect of the filing of the specification to be paid, the applicant shall, subject to the other provisions of this Part, be entitled to the exclusive privilege of making, selling and using the invention in the Territories of Mysore, and of authorizing others so to do, for a term of fourteen years from the date of the filing of the specification.

(2) But an exclusive privilege in respect of an invention of a new manufacture shall, notwithstanding anything in Sub-Section (1), cease, if the inventor fails to pay, within the time limited in that behalf by the fourth schedule, any fee prescribed in that schedule in respect of the continuance of the privilege.

(3) If, nevertheless, in any case, by accident, mistake, or inadvertence, an inventor fails to pay any such fee within the time so limited, he may apply to the Government of Mysore for an enlargement of the time for making the payment.

(4) Thereupon the Government of Mysore may enlarge the time accordingly, on payment of the fee prescribed in that behalf in the fourth schedule, and subject to the following conditions, namely :—

(*a*) the time for making a payment shall not in any case be enlarged for more than three months ; and

(*b*) if any suit is instituted in respect of an infringement of the exclusive privilege committed after a failure to make a payment within the time limited for the making thereof and before the enlargement of that time, the Court disposing of the suit may, if it thinks fit, refuse to award or give any damages in respect of the infringement.

W D 02300—GPB—500—24-11-16

G. R. S. VI—s-v/13]

DRAFT.

SUBJECT.....

.....

.....

Section. for
File No. 115-18
Serial No. 9

No. G 18095 one

Diary No. of letter replied to. 1354.

To

messrs Remfrey & Son
Patent & Trademark Attorneys
Calcutta

GENERAL AND REVENUE SECRETARIAT,
( )
, the.....*191* .

GENTLEMEN,

With reference to your letter No. nil dated the 28th November 1918.

I am directed to forward herewith G. O. No. G. 715-P. / G. M. 115-18-8 dated the 21/2/19 191 , authorizing mr John Nelson merchant of 86, St Vincent Street, Glasgow, Scotland to file a specification of an invention for 'Process and apparatus for the "Cracking" of Hydrocarbon oils and the like'

and to request that the fact may be communicated to the party concerned.

I have, etc.

Date of issue 21/2/19

Signed by [illegible]

Recd 10.2.19

12/2

for *Secretary to Government.*

10.2.19

REGISTERED.

16854

G.M.115-18 10.

24 MAR 1919

To

THE ~~CONTROLLER OF PATENTS,~~ SECY TO THE GOVT OF MYSORE,
~~PATENT OFFICE,~~ GENL. & REV. DEPTS.,
~~CALCUTTA.~~ BANGALORE,
MYSORE.

FROM

REMFRY & SON,
PATENT & TRADE-MARK ATTORNEYS,
CALCUTTA.

Dated CALCUTTA, the 19th March 1919.

DEPT.	P.	FILE LR.	M.
FILE INDICATION			
Mysore Pats. (Genl)			

SIR, 6419

re J. NELSON. (MYSORE)

No. 6/18-19 *dated*

Pursuant to the Order granting leave in this matter dated -th February 1919, Register No. 6 of 1918-19, we have the honour to forward herewith 4 copies of the Specification of JOHN NELSON, Merchant, of 86, St. Vincent Street, Glasgow, Scotland, in respect of his Invention for "PROCESS AND APPARATUS FOR THE "'CRACKING' OF HYDROCARBON OILS AND THE LIKE".

The abovementioned Order is enclosed and we solicit the favour of your filling in the Certificate at foot thereof and having same signed.

A Post Office Order for Rs. 30/- is sent today.*

We have the honour to name our Office in Calcutta as the Address for Service under the Act.

We have the honour to be,
Sir,
Your very obedient servants,

REMFRY & SON

*Part of P.O.O. for Rs. 90/-.

Enclos:-
4 Specns.
Order.

I.M.B.

P/O (Genl.) 1,000—7-6-18 [4-2-14—17-3-11].

GOVERNMENT OF HIS HIGHNESS THE MAHARAJA OF MYSORE.

GENERAL AND REVENUE SECRETARIAT.

Bangalore, Dated 4.4.1919

No. 22574

G.Dn. 115-18-11

NOTIFICATION.

(PATENT)

The following specification of an invention has been filed in accordance with Sections 8, 9, 10 and 11 of Regulation XI of 1894 (The inventions and Designs Regulations) and is open to inspection at the Mysore Government Secretariat on application to the Chief Secretary to the Government of His Highness the Maharaja of Mysore, and on payment of a fee of one Rupee.

By Mr John Nelson, merchant of 86, St Vincent Street, Glasgow, Scotland.

"Invention for "Process and apparatus for the 'Cracking' of Hydro-Carbon oils and the like."

By Order,

for the Chief Secretary to Government.

To

The Compiler, Mysore Gazette, for publication.

COUPON. *The remitter may write here any communication to the payee.*

Rs. 90 As. 0.

re: W. LOBELL, (MYSORE)
No. 3/17-18

re: MARCONI'S WIRELESS TEL. CO.
No. 5/18-19 (Do.)

re: J. NELSON. (Do.) Remitter.
No. 6/18-19

20/3/19

Rec'd 24-3-19 (Finance Section)

G. R. S. VI—s-v/18

DRAFT.

SUBJECT.....

.....

.....

No.

Section. Jn
File No. 115-18
Serial No. 12

No 22574/Inv-12

Diary No. of letter replied to 16854

GENERAL AND REVENUE SECRETARIAT
( )
the .....*191* .

To
Messrs Remfrey and Sons
Patent & Trade mark Attorneys
Calcutta

Date of issue 4.4.19

Signed by for Secy

Sir,

With reference to your letter dated 19-3-19 I am directed to forward copy of a Notification No. 22574 dated 4.4.19 G.R.115-18-11 issued by this Government in regard to the invention filed by you under Regulation XI of 1894 (The Inventions and Designs Regulations.) & to request to intimate the fact to the party concerned

The order granting permission to file specification is herewith returned, with the certificate at foot, duly filled in and signed.

I have, etc.,

for Chief Secretary to Government.

B 4/4/1919

3869/15

G. R. S. VI.—s-v/12]

DRAFT.

SUBJECT.....

.....

.....

Section. for
File No. 115-18
Serial No. 13 alone to each

Diary No. of letter replied to 16854 No. G 2257-13

GENERAL AND REVENUE SECRETARIAT,

( )

, *the*.....191

(1). *The Superintendent, Govt. Museum.*
(2) *The Chief Engineer of Mysore.*
(3) ~~The~~ Registrar Mysore University, Mysore

Date of issue 4.4.19.

Signed by Mr M. V. Iyengar

Has the honor to forward herewith for record in his office copy of a specification of an invention for "Process and apparatus for the 'Cracking' of Hydro-Carbon oils and the like" by mr. John Nelson, merchant of 86, St Vincent Street, Glasgow, Scotland

By Order,

Foreign *Secretary to Government.*

Gm 115-18-19

Duplicate.

(To be returned to the General and Revenue Secretariat for being placed in the file.

1. No. 148

2. Date of Remittance 28-3-1919

3. From whom received Messrs Rempey and Sen Patent & Trade mark Attorneys Calcutta

4. Date of receipt of amount in the General and Revenue Secretariat 26-3-1919

5. On what account Filing fees in respect of Gm. No. 607 1918-19 by Mr J Nelson & Sons

6. Amount (in figures and words) Rs 30/-
Rupees Thirty only

7. The head to which it should be credited.

(To be filled in by the Treasury.)

for Chief Secretary to Government,
~~General Department.~~

The above amount has been duly received and credited in the Treasury on this date.

Date 31 MAR 1919

STATE HUZUR TREASURY BANGALORE

Hd. Asstt. Treasurer. Treasury Officer.

N. B.—Both the counterfoil and the duplicate to be returned to the General and Revenue Secretariat duly signed by the Treasury Department.